

1. A method of forming a polymeric film or nonwoven fibrous web including the steps of:

providing a polymeric film or nonwoven fibrous web; and

interdigitally stretching the film or web throughout its depth

5 along a plurality of lines while controlling said film or web in a substantially unstretched condition adjacent said lines to reduce breakage.

Patented by the inventor

2. The method of claim 1 wherein controlling the film or web in the substantially unstretched condition is performed by creating slack areas along the length of the film or web prior to interdigital stretching.

3. The method of claim 2 wherein the slack is created by passing a preselected area of the film or web between opposed rollers.

4. The method of claim 2 wherein the slack is created by passing a preselected area of the film or web over a bar.

5. The method of claim 2 wherein the step of creating the slack areas is selected from the group consisting of folding, corrugating, furrowing, gathering, creasing and overlapping a preselected area of the film or web.

6. The method of claim 1 wherein the film or web is thermoplastic which is heated during stretching.

7. The method of claim 1 which includes the step of making a laminate of said film or web prior to said interdigitally stretching.

8. The method of claim 1 wherein the polymeric film is a thermoplastic film having a polymer selected from the group consisting of a biodegradable polymer, an elastomer and a polyolefin.

9. The method of claim 8 wherein the thermoplastic polymer is selected from the group consisting of polyethylene, polypropylene and copolymers thereof.

10. The method of claim 8 wherein the thermoplastic polymer is an elastomeric polymer.

11. The method of claim 10 wherein said elastomeric polymer is selected from the group consisting of poly(ethylene-butene), poly(ethylene-hexene), poly(ethylene-octene), poly(ethylene-propylene), poly(styrene-butadiene-styrene), poly(styrene-isoprene-styrene), poly(styrene-ethylene-butylene-styrene), poly(ester-ether), poly(ether-amide), poly(ethylene-vinylacetate), poly(ethylene-methylacrylate), poly(ethylene-acrylic acid), poly(ethylene butylacrylate), polyurethane, poly(ethylene-propylene-diene), and ethylene-propylene rubber.

12. The method of claim 1 wherein said nonwoven fibrous web contains fibers selected from the group consisting of polypropylene, polyethylene, polyesters, cellulose, rayon, nylon and blends or coextrusions of two or more such fibers.

13. The method of claim 1 wherein the polymeric film comprises a blend of linear low density polyethylene and low density polyethylene.

14. The method of claim 13 wherein the polymeric film additionally comprises calcium carbonate filler particles.

15. The method of claim 14 wherein the polymeric film comprises:

about 35% to about 45% by weight of a linear low density polyethylene,

5 about 3% to about 10% by weight of a low density polyethylene,

about 40% to about 50% by weight calcium carbonate filler particles, and

up to about 6% by weight of a rubber compound.

16. The method of claim 1 wherein the interdigital stretching of the film or web is performed across the width or length thereof.

17. A device for preventing breakage in a polymeric film or nonwoven web during stretching comprising:

a first interdigital roller;

5 a second interdigital roller, intersecting the first interdigitating roller, the intersection of said first and second interdigital roller serving to interdigitally stretch a length of the film or web along a plurality of lines across its width except in a substantially unstretched area of the film or web adjacent said lines along its length; and

10 at least one disc for contacting said film or web area and pressing said area into the first interdigital roller without substantially stretching the film or web in said area adjacent said lines during said interdigital stretching.

18. The device of claim 17, further comprising at least one set of interengaging spaced rollers for creating the substantially unstretched area along the length of the film or web.

19. The device of claim 17 further comprising a bar for creating the substantially unstretched area along said length of film or web.

20. The device of claim 17 further comprising a member for creating the substantially unstretched area along said length of film or web selected from the group consisting of a folder, corrugater, furrower, gatherer, creaser, progressive roll former, and overlapper of said film or web.

21. A device for preventing breakage in a polymeric film or nonwoven fibrous web during stretching comprising:

a first interdigital roller;

5 a second interdigital roller, intersecting the first interdigitating roller, the intersection of said first and second interdigital roller serving to interdigitally stretch a length of the film or web along a plurality of lines across its width except in a substantially unstretched area of the film or web adjacent said lines along its length; and

10 a controller for creating at least one substantially unstretched area along the length of the film or web adjacent said lines during said interdigital stretching.

22. The device of claim 21 comprising a plurality of said controllers.

23. The device of claim 21 further comprising a presser for forcing the substantially unstretched film or web area into the first interdigital roller.

24. The device of claim 23, wherein the presser includes at least one rotatable disc for contacting the substantially unstretched film or web area and pressing said area into the first interdigital roller without substantially stretching said area.

25. The device of claim 21, further comprising a member for creating the substantially unstretched film or web area wherein the controller is selected from the group consisting of a folder, corrugater, furrower, gatherer, creaser, progressive roll former, and overlapper of said film or web.

26. The device of claim 21, wherein the controller is laterally adjustable.